UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/503,834	02/15/2000	Francois Patenaude	Borden-P11US0	5465

7590   04/29/2003

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EXAMINER
PRETLOW, DEMETRIUS R

ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 04/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No.	Applicant(s)
	09/503,834	PATENAUDE, FRANCOIS
	Examiner	**Art Unit**
	Demetrius R. Pretlow	2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _12 March 2003_ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under _Ex parte Quayle_, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-39_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-7 and 23-29_ is/are rejected.

7)☒ Claim(s) _8-22 and 30-39_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _15 February 2000_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

        1.☒ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____ .

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by

Higgins et al. Higgins et al. teach representing the signal as a series of discrete

frequency and amplitude values by using a Fast-Fourier-Transform. Note column

6, lines 4-42. Higgins et al. teach a histogram based on the discrete frequency

and amplitude values. Note column 7, lines 1-30. Higgins et al. teach deriving a

noise floor estimate from characteristics of the histogram. Note column 7, lines

31-43.

In reference to claim 23, Higgins et al. teach the digitizer module (23); a

histogram module (75); and an estimation module (80, 90). Note column 4, lines 64-67,

column 5, line 1; column 7, lines 23-28; and column 7, lines 1-16.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2-7,24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al. in view of Kleider et al. and Fry. Higgins et al. teach sampling a signal by an analog-to-digital converter (23); windowing the output signals; and applying a mathematical transform to the results of the windowing. Note Higgins et al. column 5, lines 40-46 and column 6, lines 4-42.

Higgins et al. does not teach converting an amplitude to a log domain representation and rounding the log-domain representation to the nearest integer value.

Kleider et al. teach converting the amplitude into a log-domain representation. Note Kleider et al. column 4, lines 51-61 and Figures 4-7. Rounding the log-domain representation to the nearest integer value is inherent to the system of Kleider et al. Note Kleider et al. Figures 3-7.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Higgins et al., and Kleider et al., because it would allow the classification of communication signals. Note Kleider et al. column 2, lines 46-48.

Higgins et al. and Kleider et al do not teach a plurality of analog-to-digital converters. Fry teach the use of a plurality of analog-to-digital converters. Note Fry Figure 1 and column 4, lines 63-67 and column 5, lines1-5.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Higgins et al., Kleider et al., with Fry

because it would help determine the phase difference between channels and the angle of arrival of a received signal. Note Fry , Abstract, lines 12-20.

In reference to claims 4 and 26, Higgins et al. teach a Fast Fourier Transform. Note Higgins et al. column 6, lines 15-19.

In reference to claim 3, selecting a discrete valued weighting function and multiplying the value of each ouput signal of the series by a corresponding element of the discrete weighting function would be inherent to the invention of Higgins et al. Note Higgins et al. claims 3-4.

In reference to claims 5 and 27, Higgins et al. does not teach multiplying 20 by the base10 logarithm. Kleider et al. teach converting the amplitude into a log-domain representation and converting the amplitude values to a log-domain value which would suggest that multiplying 20 by the base10 logarithm would be inherent to the invention of Kleider et al. Note Kleider et al. column 4, lines 51-61 and Figures 4-7. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Higgins et al. and Kleider et al because multiplying 20 by the base 10 logarithm would allow the classification of communication signals as decibels. Note Kleider et al. column 2, lines 46-48.

In reference to claims 6 and 28, Higgins et al. does not teach decibel values. Kleider et al. teach decibel values. Note Kleider et al. Figures 3-7. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Higgins et al. and Kleider et al because decibel values would

allow the classification of communication signals. Note Kleider et al. column 2, lines 46-48.

In reference to claims 7 and 29, expressing amplitude being expressed as decibel milliwatt would be inherent to the invention of Kleider et al. Note Kleider et al. column 2, lines 46-48 and Figures 3-7.

Claim 24 contain limitations similar to those in claim 2, which was discussed above.

Allowable Subject Matter

5. Claims 8-22, and 30-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The primary reason for the allowance of claim 8 is the inclusion of the method steps of establishing a lowest bin representing the lowest integer dB value of the discrete series representing the wideband signal; establishing a highest bin representing the highest integer dB value of the discrete series representing the wideband signal; establishing bins for each integer dB value between the lowest and highest bins; incrementing the value of each bin when the segment of the series representing the wideband signal crosses the bin with a positive slope. It is this step found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 9-13 is the inclusion of the method step of defining the lowest dB as the starting point; determining the next lowest valued local maximum on the histogram; performing a Y test; repeating steps b and c until Y fails; setting the noise floor by adding an offset to the dB value of the maximum of the histogram that caused the Y test failure. It is these steps found in each of the claims, as it is claimed in the combination, that have not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 14-22 is the inclusion of the method steps of establishing a lowest bin representing the lowest integer dB value of the discrete series representing the wideband signal; establishing a highest bin representing the highest integer dB value of the discrete series representing the wideband signal; establishing bins for each integer dB value between the lowest and highest bins so that there are a total of MK bins; incrementing the bins for each time an element falls into the bin. It is this step found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 30 is the inclusion of the limitations of an low bin establishing element for creating a low valued bin to represent the lowest integer dB value of the discrete series representing the wideband signal; a high bin establishing element for creating a high valued bin to represent the highest integer value of the discrete series representing the wideband signal; a tertiary bin creation element for creating a bin for integer dB value between the lowest and the highest bins;

a bin count incrementing element for incrementing the value of each bin when the

segment of the series representing the wideband signal crosses the bin with a positive

slope. It is these limitations found in each of the claims, as they are claimed in the

combination, that has not been found, taught or suggested by the prior art of record

which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 31-35 is the inclusion of the limitations

of an maxima finding element for finding the next left most maximum from a given

starting point, that in the absence of previous data takes the lowest dB bin as a starting

point; a decision element for calling upon the maxima finding element until the Y test

element reports a fail; and a noise floor setting element for providing a nois floor

estimate by adding an offset to the dB value reported by the maxima finding element

that caused the Y test element to report a fail.. It is these limitations found in each of the

claims, as they are claimed in the combination, that has not been found, taught or

suggested by the prior art of record which makes these claims allowable over the prior

art.

The primary reason for the allowance of claim 36 is the inclusion of the limitations of

an low bin establishing element for creating a low valued bin to represent the lowest

integer dB value of the discrete series representing the wideband signal; a high bin

establishing element for creating a high valued bin to represent the highest integer

value of the discrete series representing the wideband signal; a tertiary bin creation

element for creating bins for each integer dB value between the lowest and the highest

bins; a bin count incrementing element for incrementing the value of a bin for each time

an element in the discrete series falls into the bin. It is these limitations found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 37-39 is the inclusion of the limitations of a sorting the element for creating a vector containing the discrete amplitudes of the input signal in decreasing order; a vector size element for reducing the size of the sorted linear vector from MK elements to M elements by summing groups of K consecutive elements of the sorted linear vector for achieving a more discretised amplitude representation; a log-likelihood element applying one of a log –likelihood or quasi log-likelihood function, to the M elements of the sorted linear vector output from the vector reducing element to achieve a discrete function $L(k)$; a penalty function element for subtracting $L(k)$ from a multiple (C) of a discrete penalty function $p(k)$ to obtain the function $-L(k) + C\,p(k)$; and index identification for identifying the index at which the minimum of the PLLM function $-L(k) + C\,p(k)$, is achieved and identifying the index, denoted by Qnf at which the minimum of the $-L(k) + C\,p(k)$ equation is achieved; and a noise floor setting element for providing a noise floor level estimate by dividing the mean of the M-qnf-1 smallest value of the M sorted vector by K. It is these limitations found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

Response to Arguments

6. Applicant's arguments filed June 20, 2002 have been fully considered but they

   are not persuasive. The applicant argues that Higgins et al. does not teach

   histograms are not based discrete frequency and amplitude values of continuous

   signal representations; and that the combined cited art offers no suggestion for

   application of log-domain representation and plurality of analog-to-digital

   converters. This is not found convincing because the claim language given its

   broadest reasonable interpretation reads on the prior art taught by Higgins et al.

   Kleider et al. and Fry.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the

   examiner should be directed to Demetrius R. Pretlow whose telephone number is

   (703) 308-6722. The examiner can normally be reached on Monday - Friday

   from 8:00 am to 4:30 pm.

   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John Barlow, can be reached at (703) 308-3126. The fax phone number for

the organization where this application or proceeding is assigned is (703) 308-7722.

   Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is (703) 308-

1782.

Demetrius R. Pretlow

Patent Examiner

Demetra Prellos 4/21/03

John Barlow
Supervisory Patent Examiner
Technology Center 2800